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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,817	07/29/2003	Mustafa Michael Pinarbasi	HSJ920030030US1	8155

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Hitachi Global Storage Technologies  
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5600 Cottle Road (NHGB/014-2)  
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EXAMINER
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WATKO, JULIE ANNE

ART UNIT	PAPER NUMBER
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2653

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/630,817

Applicant(s)

PINARBASI, MUSTAFA MICHAEL

Examiner

Julie Anne Watko

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 25-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 24 is/are rejected.
- 7) ☒ Claim(s) 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 07/29/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of group I, claims 1-24, in the reply filed on January 31, 2005, is acknowledged. Claims 25-28 are withdrawn as non-elected.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation "the pinned layer structure is located between the spacer layer and the cap layer" in lines 1-2. It is unclear how this limitation can be satisfied simultaneously with the limitation "the free layer structure is located between the spacer layer and the cap layer" of claim 10 and the limitation "spacer layer located between the pinned layer structure and the free layer" of claim 4.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Kagami et al (JP 2003-60262 A).

As recited in independent claim 1, Kagami et al show a magnetic read head (see Fig. 13) comprising: a current perpendicular to the planes (CPP) sensor; the CPP sensor having a top cap layer 127 structure; and the cap layer structure being composed of ruthenium (Ru) or rhodium (Rh) (see ¶ 0109, “up metal layer 127 can be formed with the same ingredient as the up metal layer 27 in drawing 4”; see also ¶ 0065, “As for such a viewpoint to the up metal layer it is desirable to form by the monolayer or the multilayer using the simple substance of Ru, Rh, ... or the alloy”; see also ¶ 0062, “up metal layer (cap layer) 27”).

As recited in independent claim 12, Kagami et al show a magnetic head assembly (see Fig. 2) comprising: a write head 3; a read head 2 adjacent the write head; the read head comprising: a current perpendicular to the planes (CPP) sensor (including 23, 24, 25, 26, 125, 124 and/or 123; see Fig. 13); the CPP sensor having a top cap layer structure 127; and the cap layer structure being composed of ruthenium (Ru) or rhodium (Rh).

As recited in claims 2, 6, 15 and 19, Kagami et al show that the material of the cap layer structure is Ru (see teaching above for claim 1).

As recited in claims 3, 9, 14 and 20, Kagami et al show that the material of the cap layer structure is Rh (see teaching above for claim 1).

As recited in claims 4, 13 and 18-20, Kagami et al show a ferromagnetic pinned layer structure (23 or 123); a ferromagnetic free layer 26 structure; a nonmagnetic spacer layer (25 or 125) located between the pinned layer structure and the free layer structure.

As recited in claims 5 and 14, Kagami et al show ferromagnetic first and second shield layers (21 and 28), the CPP sensor (including 23, 24, 25, 26, 125, 124 and/or 123) being located between the first and second shield layers (see Fig. 13); and the first and second shield layers serving as first and second leads (see ¶ 0062, “lower electrode 21 and the up electrode 28 are made to serve a double purpose as lower magnetic shielding and up magnetic shielding”) for conducting a current through the CPP sensor in a direction perpendicular to major thin film planes of the CPP sensor.

As recited in claims 7 and 10, Kagami et al show that the free layer structure 26 is located between the spacer layer 25 and the cap layer structure 127.

As recited in claims 8 and 11, to the extent understood, Kagami et al show that the pinned layer 124 structure is located between the spacer layer 125 and the cap layer 127 structure.

As recited in independent claim 17, Kagami et al show a magnetic disk drive (see ¶ 0002, “HDD”) comprising: at least one magnetic head assembly (see Fig. 2) that has a head surface; the magnetic head assembly having a write head 3 and a read head 2 (see teachings above for claims 1 and 5); a housing (inherent), a magnetic medium (disk) supported in the housing; a support (see Fig. 14) mounted in the housing for supporting the magnetic head assembly with said head surface facing the magnetic medium so that the magnetic head assembly is in a transducing relationship with the magnetic medium; a motor for (inherently) moving the magnetic medium; and a processor (inherently) connected to the magnetic head assembly and to the motor for exchanging signals with the magnetic head assembly and for controlling movement of the magnetic medium.

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6. Claims 21 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito (US PAP No. 2004/0001976 A1).

As recited in claim 21, Saito shows a magnetic read head (see Fig. 1 or Fig. 2) comprising: a current perpendicular to the planes (CPP) sensor; the CPP sensor having a top cap layer structure which includes: a first layer (51 or 32) of tantalum (Ta) only; a second layer (52 or 31) of ruthenium (Ru), rhodium (Rh) or gold (Au); and the first layer being located between and interfacing a spacer layer 42 and the second layer.

As recited in claim 24, Saito shows that the second layer is Au (see teaching above for claim 21).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US PAP No. 2004/0001976 A1) in view of Shimazawa et al (JP 2000-22803).

Saito shows a magnetic read head as described above for claims 21 and 24.

As recited in claim 22, Saito is silent regarding whether the second layer is Ru.

Shimazawa et al show a cap layer structure comprising Ta/Ru (see ¶ 0018, "Ta/Ru").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the Ta/Au cap of Saito with a Ta/Ru cap as taught by Shimazawa et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to use Ta/Ru as

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a cap layer in order to decrease a milling depth so as to simplify a production process (see ¶ 0019) while preventing diffusion into layers of the sensor so as to reduce Barkhausen noise (see ¶ 0015).

***Allowable Subject Matter***

9. Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

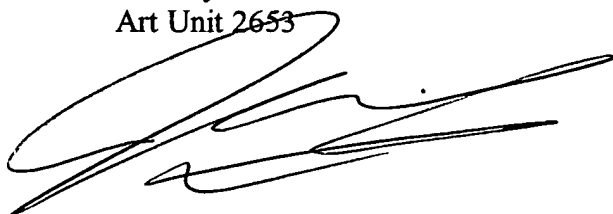
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Anne Watko whose telephone number is (571) 272-7597. The examiner can normally be reached on Tue & Thu until 5, Wed until 3:30, Mon & Fri late.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Julie Anne Watko  
Primary Examiner  
Art Unit 2653

July 18, 2005  
JAW

A handwritten signature in black ink, appearing to read 'Julie Anne Watko', written over the printed name and title.